ONTARIO
FISH AND WILDLIFE
REVIEW

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ONTARIO

DEPARTMENT OF LANDS AND FORESTS

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ONTARIO
FISH AND WILDLIFE
REVIEW

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CONTENTS PAGE

How Much Do Ontario Deer Weigh? 2
By H.G. Cumming

Weights of Ontario Moose. 10
By D.W. Simkin

Controlled Hunting at Long Point Bay. 13
By J. Douglas Roseborough

The Farmer and Wildlife. 20
By C.H.D. Clarke

Commercial Fishing in the Great Lakes. 28
By W.H.R. Werner

THE COVER

The moose is readily distinguished by its great size, being the largest member of the deer family. Most bulls have shed their antlers by late December but some keep them well into the winter. The fine specimen pictured on our cover might tip the scales at about 1000 pounds. We are indebted to the Department of Northern Affairs and National Resources for the use of this photograph. J.A. Macfie, Fish and Wildlife Supervisor at Parry Sound, submitted the photograph on the back cover to prove that good range produces heavy deer. At 2½ years, this buck already presents a weight problem to hunters.

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EDITORIAL

In every generation and in every field of activity, there are far-seeing men who are able to look beyond the dust of confusion stirred up by day-to-day difficulties and see clearly the direction they are going and the destination they wish to reach. A great deal of human progress can be attributed to men like these.

Such a man was Aldo Leopold. He has been called the father of modern game management, and his writings on the subject have as much validity to-day as they had decades ago when they were written. To illustrate: Leopold set down in 1928 a policy statement on game management consisting of the following seven points:-

ALDO LEOPOLD'S 1928 AMERICAN GAME POLICY

1. Extend public ownership and management of game lands just as far and as fast as land prices and available funds permit. Such extensions must often be for forestry, watershed, and recreation, as well as for game purposes.
2. Recognize the landowner as the custodian of public game on all other land, protect him from the irresponsible shooter, and compensate him for putting his land in productive condition. Compensate him either publicly or privately, with either cash, service or protection, for the use of his land and for his labor, on condition that he preserves the game seed and otherwise safeguards the public interest. In short, make game management a partnership enterprise to which the landholder, the sportsman, and the public each contribute appropriate services, and from which each derive appropriate rewards.
3. Experiment to determine in each state the merits and demerits of various ways of bringing the three parties into productive relationship with each other. Encourage the adoption of all ways which promise to result in game management. Let the alternative ways compete for the use of the land, subjecting them to public regulation if this becomes necessary.
4. Train men for skillful game administration, management and fact-finding. Make game a profession like forestry, agriculture, and other forms of applied biology.
5. Find facts on what to do on the land to make game abundant.
6. Recognize the non-shooting protectionist and the scientist as sharing with sportsmen and landowners the responsibility for conservation of wild life as a whole. Insist on a joint conservation program, jointly formulated and jointly financed.
7. Provide funds. Insist on public funds from general taxation for all betterments serving wild life as a whole. Let the sportsmen pay for all betterments serving game alone. Seek private funds to help carry the cost of education and research.

In 1928, this was far-fetched fantasy in the United States. Hunting was sport, to be pursued where and when convenient. Success, or lack of it, was as unpredictable and changeable as the weather. The idea of spending public funds to improve hunting was not very sensible to large numbers of law-makers.

Anyone reading this statement to-day can endorse every word of it. In many parts of the United States, great progress has been made on the course Leopold charted. In Canada, we are following the same course and are making progress. The vision that enabled Leopold to see ahead into the following generation still guides people who have followed him in his profession.

HOW MUCH DO DEER WEIGH?

by H.G. Cumming
Biologist, Maple

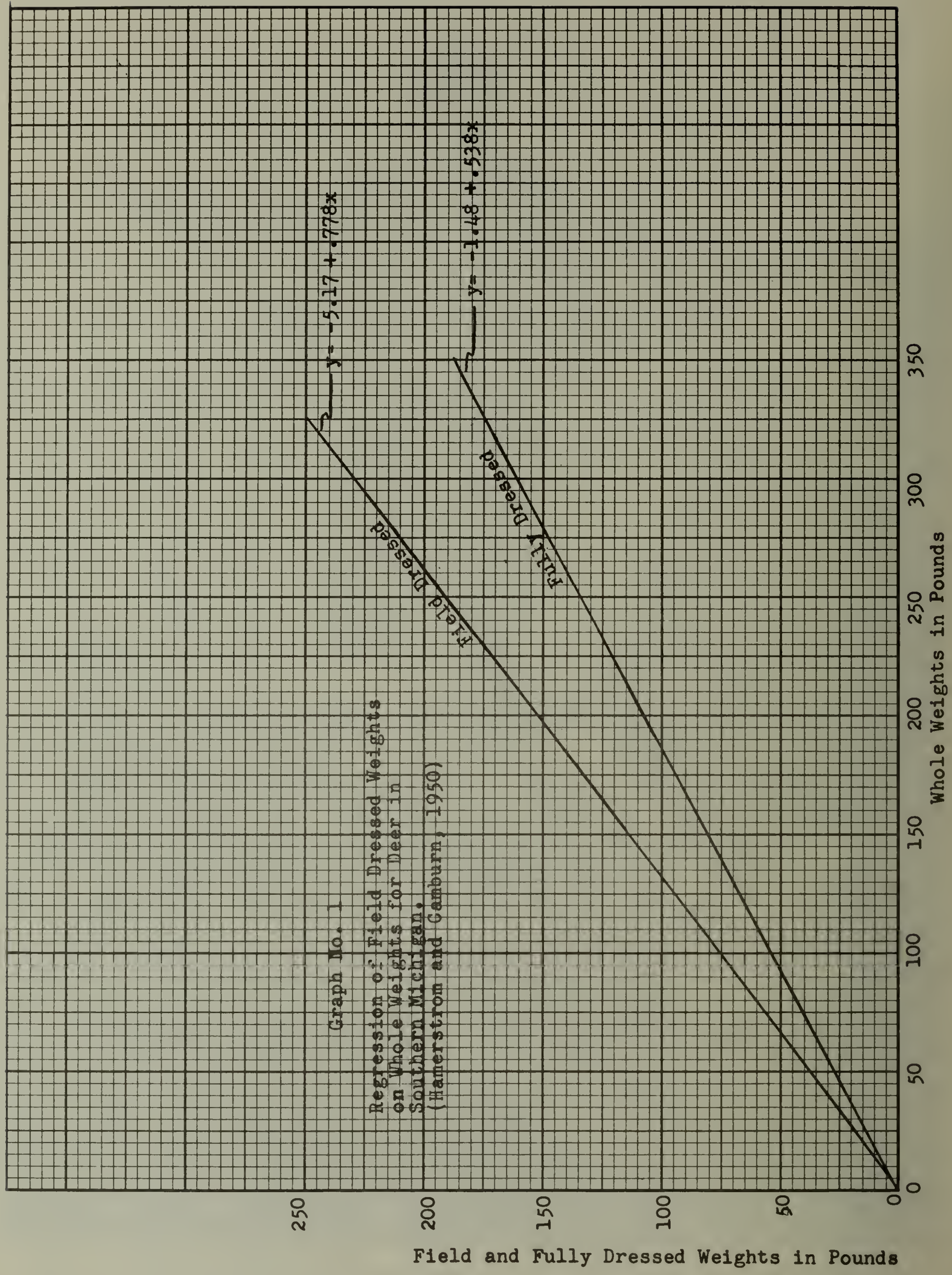
Each autumn, during the open season for deer, field staffs of the Department of Lands and Forests operate many deer checking stations throughout Ontario. At the checking stations, hunters are questioned and their deer are examined to obtain facts which are necessary for sound deer management. For several years, weights of deer have been recorded along with the other information. The data used here are taken from Department records of deer weighed at checking stations, from an unpublished report by Peter Graham summarizing the weights of Ontario deer for several years, and from a paper in the New York Fish and Game Journal, July, 1955, by C. W. Severinghaus, entitled, "Deer Weights as an Index of Range Conditions on Two Wilderness Areas in the Adirondacks Region".

All the weights listed are "field dressed" weights. After shooting a deer, hunters remove all the intestines and blood, but leave attached the head, feet and hide. It is in this state that deer are brought to the checking stations. The relation between field dressed weights and whole weights can be seen in Graph No. 1. The graph is based on weights of 131 deer from southern Michigan, reported by F.N. Hamerstrom, Jr., and F. Lawrence Camburn in an article entitled, "Weight Relationships in the George Reserve Deer Herd", and published in the Journal of Mammalogy, Vol. 31, No. 1, 1950. From this graph, hunters will be able to estimate the whole weight of any field dressed deer. It is also possible to obtain an estimate of the weight of the deer when fully dressed; that is, when the head, hide and feet are removed and the carcass is sawed lengthwise and given a final trimming and cleaning so that it is ready to butcher.

As an example of how the graph may be used, suppose that a deer is weighed and found to be 150 pounds field dressed. By running the eye along the horizontal line, opposite 150, to the oblique line, marked field dressed, and down the vertical line from that point to the scale for whole weights, it will be seen that the 150-pound field dressed deer would have weighed about 200 pounds, whole weight. The fully dressed weight can be estimated by running the eye back up the vertical line, from 200 pounds whole weight, until it meets the line for "fully dressed", thence along the horizontal line to the scale for fully dressed weights. When this is done, it will be seen that the deer weighing 200 pounds whole weight would weigh about 106 pounds when fully dressed. In the same way, all the weights in this report, as well as any other field dressed deer weights, can be converted to their approximate whole or fully dressed equivalents.

A series of weights can provide very useful information about the deer herd. Since Ontario lies on the northern edge of the North American deer range, we are always interested in the effects of severe winters on deer. Table No. 1 shows the influence of the severe winter of 1955-56 on the weights of deer in western Ontario. During that winter, snow depths were much greater than

Biologist Harry Lumsden weighs deer and Conservation Officer Eddie Shears makes notes. The weight, age and sex of each animal is carefully recorded.



Graph No. 1

Regression of Field Dressed Weights on Whole Weights for Deer in Southern Michigan.
(Hamerstrom and Camburn, 1950)

Western Region of Ontario

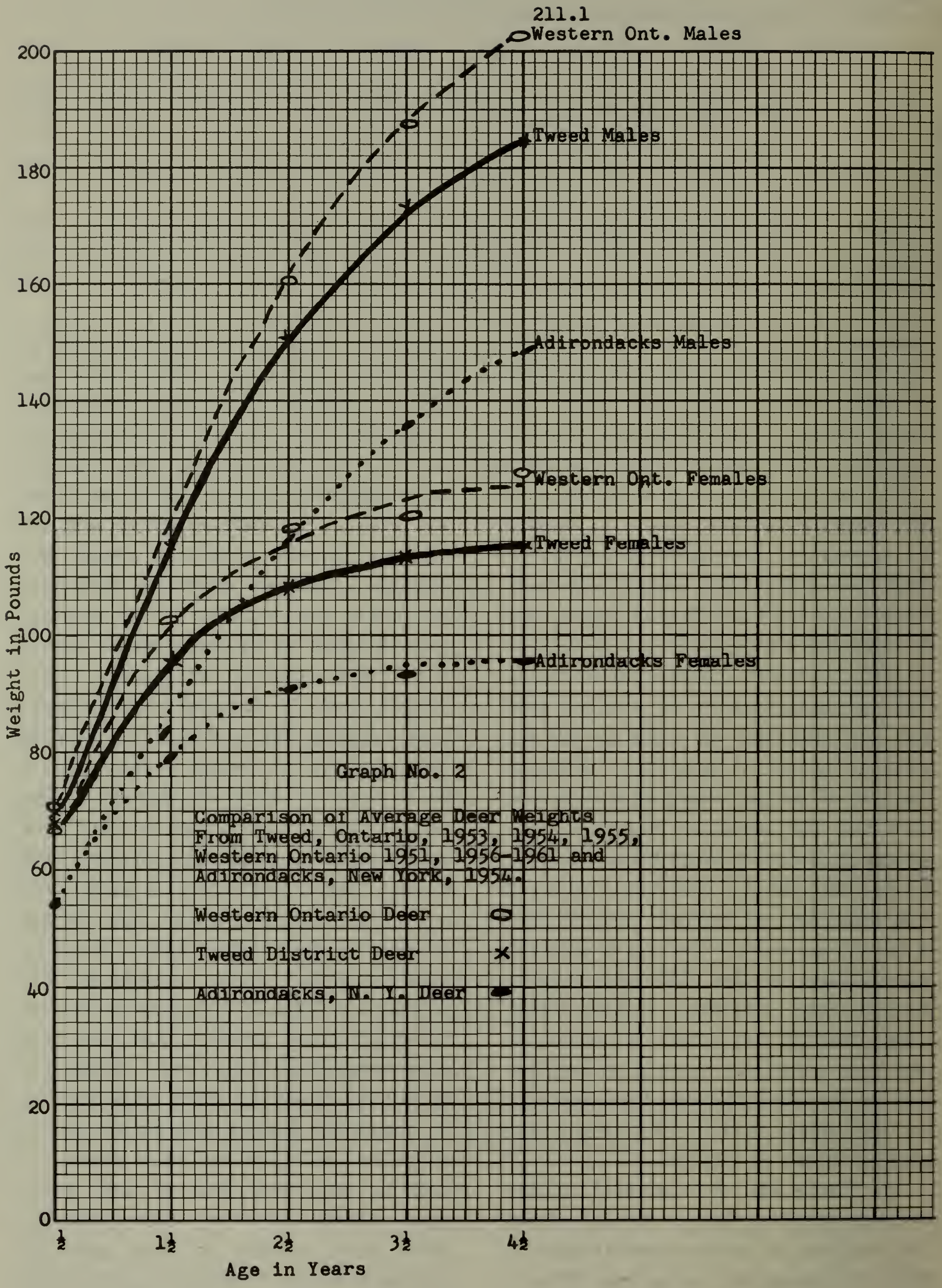
Table 1 Weights of Fawns and Yearlings for 7 Years

	1951		1956		1957		1958		1959		1960		1961	
Year	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean	No.	Mean
M. Fawns	33	71.4	13	59.0	12	76.0	6	72.5	14	73.5	1	56.0	9	63.3
M. Yearlings	15	109.8	6	94.5	9	121.8	7	129.5	6	126.1	6	122.2	7	102.1
F. Fawns	25	67.6	7	55.6	22	70.5	9	67.4	14	67.1	3	65.7	6	59.2
F. Yearlings	14	99.7	7	97.9	5	116.6	5	111.4	10	99.7	1	110.0	3	99.0

normal and many deer starved. The fact, that the surviving deer were not able to fully recover from this period of stress by the following autumn, can be seen by comparing the weights of the fawns and yearlings from the 1956 hunt with those from other years. Although the numbers of deer weighed are small, the fact that the mean weight was much reduced for male and female fawns, and for male and female yearlings in the fall of 1956, provides convincing evidence that the summer period of plentiful food was not sufficient to make up for the previous winter of scarcity. Although the loss of weight among yearlings was obviously the result of too little food during the period of deep snow, the connection between the previous winter and the reduction in average fawn weights is not so apparent. The winter affected fawns, born in the following spring, through their mothers. Does, which came through the previous winter in very poor condition, were weak and unable to provide sufficient food and care for the young deer. The result was smaller fawns in the fall.

In Table No. 2, the first column presents totalled figures for all of the deer weighed in northwestern Ontario in 1951 and during the period from 1956 to 1961. The second column gives the weights of deer from the Tweed District checking stations in 1953, 1954 and 1955. The third column shows the weights of deer reported by Severinghaus in 1954 for overbrowsed areas of the Adirondack Mountains of New York State. The number of deer weighed and the minimum weight, maximum weight and average weight are shown for each sex, age class and location. The smallest deer weighed in western Ontario was a buck fawn weighing 42 pounds. The largest was a four-and-a-half-year-old buck weighing 288 pounds. The smallest deer weighed in Tweed District was a buck fawn of only 35 pounds. The largest deer in Tweed was an adult buck weighing 250 pounds. The smallest deer in the Adirondacks was a buck fawn weighing only 24 pounds. The largest deer in the Adirondacks was a four-and-a-half-year-old buck weighing 210 pounds. It must be remembered in considering these weights that the deer were weighed as they came. There was no attempt to choose extra large animals.

Graph No. 2 shows the growth curves of bucks and does for each place. It will be seen that deer of both sexes grow rapidly at first, then gradually slow their growth as they approach maximum size. The bucks grow faster than the does from the beginning and



Graph No. 2

Comparison of Average Deer Weights From Tweed, Ontario, 1953, 1954, 1955, Western Ontario 1951, 1956-1961 and Adirondacks, New York, 1954.

Weights of Deer (in Pounds) in Ontario and New York

Table 2

BUCKS

	North Western Ontario (Fort Frances, Kenora, Sioux Lookout) Totals for 1951, 1956–1961				Tweed District 1953, 1954, 1955				Overbrowsed Wilderness Areas in the Adirondacks, New York–1954*			
Age	No. of Deer	Min.	Max.	Ave.	No. of Deer	Min.	Max.	Ave.	No. of Deer	Min.	Max.	Ave.
½	88	42	88	69.6	137	35	92	66.7	173	24.0	75.0	53.6
1½	56	60	145	114.7	134	70	152	113.4	166	52.0	165.0	83.6
2½	23	135	201	160.1	84	98	250	150.1	94	70.0	168.0	115.5
3½	39	125	240	188.0	85	90	248	173.6	77	80.0	205.0	135.8
4½	36	178	288	211.1	41	121	230	184.0	53	108.0	210.0	148.4
5½	14	138	239	222.2	13	160	217	137.5	25	100.0	187.0	144.2
6½	4	-	-	194.5	1	-	-	167.0	15	95.0	192.0	148.5
7½	1	-	-	126.0	0	-	-	-	8	125.0	180.0	148.6
8½	0	-	-	-	2	204	232	218.0	1	158.0	158.0	158.0
9½	0	-	-	-	1	-	-	216.0	1	125.0	125.0	125.0
Total	261				498				613			

DOES

	North Western Ontario (Fort Frances, Kenora, Sioux Lookout) Totals for 1951, 1956–1961				Tweed District 1953, 1954, 1955				Overbrowsed Wilderness Areas in the Adirondacks, New York–1954*			
Age	No. of Deer	Min.	Max.	Ave.	No. of Deer	Min.	Max.	Ave.	No. of Deer	Min.	Max.	Ave.
½	86	48	93	66.6	147	45	81	63.2	173	26.0	88.0	51.3
1½	45	78	120	102.8	141	65	130	95.8	144	50.0	114.0	79.2
2½	30	98	138	118.8	116	82	160	109.0	129	60.0	122.0	90.7
3½	56	92	178	119.4	88	86	170	113.1	172	64.0	134.0	93.2
4½	34	103	185	128.1	41	98	144	115.1	66	72.0	170.0	95.5
5½	23	119	150	124.6	7	90	112	101.7	45	62.0	140.0	94.5
6½	6	124	127	124.7	3	97	111	102.8	30	77.0	122.0	94.1
7½	4	107	147	124.2	3	97	108	103.0	29	69.0	125.0	93.8
8½	0	-	-	-	2	85	122	103.5	30	70.0	120.0	91.1
Total	284				548				818			

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* Severinghaus, C.W., Deer Weights as an Index of Range Conditions on Two Wilderness Areas in the Adirondacks Region. New York Fish and Game Journal July, 1955.

The Kaladar Deer Checking Station where many of the Tweed deer were weighed. Photo by A.W. Leman.

they continue to grow quickly for a longer time. Because the maximum weight is reached at about 4½ years, as was shown in Table No. 2, and because the number of weighed deer over four-and-a-half years is too small to allow plotting accurate curves, Graph No. 2 shows growth rates up to four-and-a-half years, only. The problem of small numbers is present to a lesser extent in all the figures for western Ontario. The western does, in particular, because of the small numbers weighed, show marked variation from the line which appears by eye to give the best fit.

Another phenomenon, apparent in both Table No. 2 and Graph No. 2, is the fact that there are differences in the sizes of deer from the three areas. In quoting the minimum and maximum figures, it was seen that the largest deer recorded came from western Ontario while the smallest recorded came from the Adirondacks. Tweed District deer weighed somewhere between. A glance down the table of weights, Table No. 2, will reveal that this condition is quite constant throughout the age groups. The differences between the deer weights for the three locations

Note - Remarks contained in our editorial in the Summer issue, 1962, were from "Gamonia, or the Art of Preserving Game" first published in London for Lawrence Rawstorne by Rudolph Ackermann in 1837. (Ed.)

can be seen even more plainly in Graph No. 2. For both male and female deer, the order of weights is the same as in Table No. 2, Western Ontario, Tweed, Adirondacks.

There may be three separate factors combining to cause the differences in deer weights. Genetic differences may be affecting the deer from the widely separated areas. This is particularly true of the Ontario deer. The western Ontario deer probably crossed into Canada from Minnesota. The Tweed deer originally crossed from south of Lake Erie and Lake Ontario. It is quite possible that these may be different genetic strains of deer.

A second factor which may cause some of the difference is known as Bergmann's Rule. It states that warm blooded animals from colder climates tend to be larger in size and hence to have less surface in proportion to body weight than do their relatives from warmer regions. The extent to which this principle may apply to the three deer herds under consideration is at present unknown, but there is a good possibility that it operates to some extent because of the differences in latitudes involved.

The third factor which may be contributing to these different weights is the quality of deer range. In western Ontario, occasional severe winters greatly reduce the numbers of deer. Although these die-offs are most unfortunate, they do have one beneficial aspect. The severe winters reduce the deer herd to a level well below the carrying capacity of the range. This means that the deer which are left have plentiful supplies of browse. In Tweed District, severe winters have much less effect on the deer herd. Although liberal hunting seasons have allowed hunters to take large numbers of the deer, the Tweed deer herd is not brought as much below carrying capacity as is the western Ontario deer herd after a severe winter. Food supplies in Tweed District are good, but they are not superabundant as in the west. The weights for the New York deer are taken from an overbrowsed area of low fertility in the central Adirondacks. Lack of access for hunters has resulted in a long-term under-harvest of the deer herd, and the deer have become so numerous that there is not enough good-quality food for proper nutrition. With insufficient food for fast and full growth, the deer weights average much less than the deer with better nutrition in Tweed.

It is apparent that deer weights, besides being interesting to hunters, can be very useful in deer management. They can provide us with information about the deer and they can suggest differences in deer range which may then be confirmed by other means. It was for these reasons that District staffs undertook to weigh deer in Ontario.

It is an accepted fact, that snow and crusting conditions can reduce our deer population to a dangerous level. Winter deer mortality surveys, carried out during the spring, have proven that numerous deer die from starvation when winter conditions are extreme.

When we consider what the deer has to overcome in his fight to survive weather conditions, predators, road kills, illegal kills, add to this the hunters' success, it is amazing their quick recovery from scarcity to abundance when given a break in the weather.—Sioux Lookout "Weekly Report" March 9/62.

WEIGHTS OF ONTARIO MOOSE

by D.W. Simkin
Biologist, Research Branch

During the first two weeks of the 1961 moose season in northwestern Ontario, a game checking station was operated by Department of Lands and Forests personnel at Red Lake Road on the Red Lake highway. The purpose of this checking station was to obtain information on the moose and deer shot by hunters in the area made accessible by this road. Since the 1957 season, various types of information such as the sex and age of the animals killed, location of kills, hunter success, reproductive tracts of adult cow moose, and tags from ear-tagged animals have been collected. In the fall of 1961, the first attempt to weigh moose at the station was made.

Due to the large size of this species, it is not an easy task to weigh whole moose unless special equipment is available. The equipment which we used at Red Lake Road consisted of a diesel powered tractor, equipped with a hydraulic front-end fork loader, a length of heavy chain and a platform scale with a specially built stretcher-like, wooden platform on which a whole moose could be placed.

Each year, several hunters manage to shoot their moose in a location where it is feasible to dress them out and bring out the whole carcass without quartering it or even cutting the head off.

A total of 14 field dressed moose (i.e., with only the blood and viscera removed) were weighed as shown in Table I.

Each year, several stories of moose in the 1500-, to 2000-pound range are circulated. As can be seen from the above table, none of the animals weigh-

Moose are strong swimmers and show remarkable speed and endurance in the water. Photo by D.W. Simkin.

Unloading a moose to weigh on the scales at the Red Lake Road Checking Station. Photo by T. Jenkins.

ed at the checking station came anywhere near this weight. The bull, 8½ - 10½ years old, was a very large animal, however, and it is doubtful if any of the more than 1500 animals which we have examined at Red Lake Road in the last four years would be even 200 pounds heavier than this large bull.

At the checking station, we were fortunate enough to have an entire adult cow (#6), which had been killed in a collision with a train, brought to us. This afforded us the opportunity to obtain the live weight of the animal and then dress it out and get the field dressed weight. Upon doing this, we found the live weight to be 761 pounds. Subtracting the field dressed weight (568 pounds) from the live weight, it was easy to calculate that the viscera constituted approximately 25 per cent of the live weight.

If the viscera of the large bull, which we weighed at 827 pounds, equalled 25 per cent of its live weight, then the live weight of this animal could be calculated at 1102 pounds.

With this in mind, we suggest that it is very unlikely that any moose in Ontario would exceed 1,400 pounds *live weight*, and stories of moose that dressed out at 1000 pounds or which weighed close to a ton, live weight, should be taken with a grain of salt. Undoubtedly some of the animals shot, in areas where they have to be carried one-half mile or more to a boat or road, might seem as though they weighed a ton.

Actually, few hunters have ever had the opportunity to weigh whole moose, nor have they ever been presented with factual information on what the average weight of moose of different ages would be. For these reasons, few hunters "guesstimate" the weight of their moose with any degree of accuracy.

Table I Weights of Moose Examined at Red Lake Road, 1961

	Age (yrs.)	Sex	Field Dressed Weights (lbs.)
1.	½	Male	254
2.	½	Female	166
3.	1½	Female	474
4.	1½	Female	485 plus weight of hind feet approx. 15 pounds.
5.	1½	Male	530
6.	2½	Female	568
7.	2½	Male	568
8.	3½	Male	650
9.	4½	Female	627
10.	4½	Female	578
11.	4½	Female	680
12.	5½-6½	Male	760
13.	8½-10½	Male	827
14.	unaged	Male	603

This was very graphically illustrated in a recent article written by Mr. Ellwood Epps in *Northern Sportsman* (Vol. 17, No. 3, April, 1962, pp. 14-15). Mr. Epps suggests in his article that the weight of most moose killed by hunters is overestimated. He proved his point by weighing a 900-pound field dressed moose which he shot last winter and then conducting a contest to see who could estimate the weight most accurately. One hundred and forty-nine people entered the contest and the "guesstimates" varied from 284 pounds to 3,827 pounds. Quite a spread!

Although we have no data from Ontario comparing "live weight" or "field dressed weight" with "butchers dressed weight", i.e., weight of the meat with head, hide, viscera and feet removed, some data collected for the slightly smaller Swedish moose are probably applicable to our Ontario moose as, although the Swedish moose is a little smaller, it is proportioned similarly. Skuncke (1949) reported that moose "butchered dressed" at 53-60 per cent of the live weight.

This is probably the reason why some hunters who, after shooting their moose and taking it to a meat processing plant and obtaining only 300 or 400 pounds of take-home meat from their one-ton moose, suspect the butcher of having obtained his winter supply of meat at their expense.

REFERENCE

Skuncke, Folke, 1949. Algen, studier jakt och vard. P. A. Norstedt and Soners, Forlag, Stockholm.

CONTROLLED HUNTING AT LONG POINT BAY

by J. Douglas Roseborough
Biologist, Maple
Photographs by George S. Brown

During the fall of 1961, duck hunters had a new experience in the Crown marshes of Long Point Bay, Lake Erie. Instead of having to build their own blinds, and later defend them from the aggression of other hunters; instead of having other hunters shoulder-to-shoulder with them in their own favourite chunk of marsh; instead of seeing their neighbours shoot at ducks far out of range—they found something entirely new.

They found blinds built for them, well spaced throughout the new 1,700-acre Waterfowl Management Unit, and rarely did they see another hunter or blind. For one day, at least, one hunter or pair of hunters were the exclusive owners of 25 acres of managed duck marsh. There was no need for excessive shooting, crowding of hunters, competition for birds in flight or birds downed. There was far less sky-busting or, at least, less tendency for shooting at ducks far out of range.

One of 150 signs surrounding Waterfowl Management Unit, Refuge and Feeding Sanctuary. Mounted on steel posts driven into the marsh, the signs were easily seen.

Controlled shooting on waterfowl areas is not a new idea, since it has been in operation elsewhere, in the United States and in private marshes in Ontario, for many years. It is a new experience, however, for duck hunters in Ontario on publicly owned marshes.

The need for control of hunters in most of Ontario has not been evident except in the heavily populated areas along the Great Lakes. In northern Ontario, for instance, there is not a great number of hunters, and they have unlimited space to set out blinds and shoot ducks in relative peace and quiet.

In the southern part of the province, where we may have nearly 150,000 duck hunters, crowding, competition and excessive shooting have drastically reduced the value of the hunting. The overcrowding and overshooting, of the marsh areas open to the public, has also caused ducks to move out of these publicly owned areas to areas where they are protected or on to other areas to the south.

It is a generally accepted principle, in all managed waterfowl areas, that ducks and geese require a considerable degree of protection if they are to be retained in the area. They cannot be heavily hunted or continuously hunted or they will leave to find refuge from hunting elsewhere.

A number of restrictions are useful in preventing ducks from moving from any area. A large refuge area, where ducks are unmolested, is the most important part of a managed marsh ineffectively retaining the ducks. In addition, restrictions on the days and hours of hunting are highly recommended. Where shooting takes place only three or four days per week, the ducks have an opportunity to rest anywhere in the marsh, and reoccupy the hunting areas as well. It is unnecessary to shoot before sunrise or after sunset, and most marsh managers believe that long hours of shooting are undesirable. With few exceptions, expert marsh managers agree that as many or more ducks can be harvested on an area if the shooting begins later in the morning and ends earlier in the afternoon.

Hunters in southern Ontario marshes have become unhappy about the bickering over space, the arguments over who shot the fallen duck, and the lack of courtesy from fellow hunters in a heavily hunted marsh. Many serious duck hunters have either purchased their own marshes or hung up their guns instead of competing in the duck hunting carnival which is especially marked on opening day. Hunting, to most, is not a competitive sport, and we believe it should never be one. Duck hunting, especially, should always be a quiet, peaceful recreation where the hunter becomes a part of his environment and, where to be successful, he must use his skill and individual abilities.

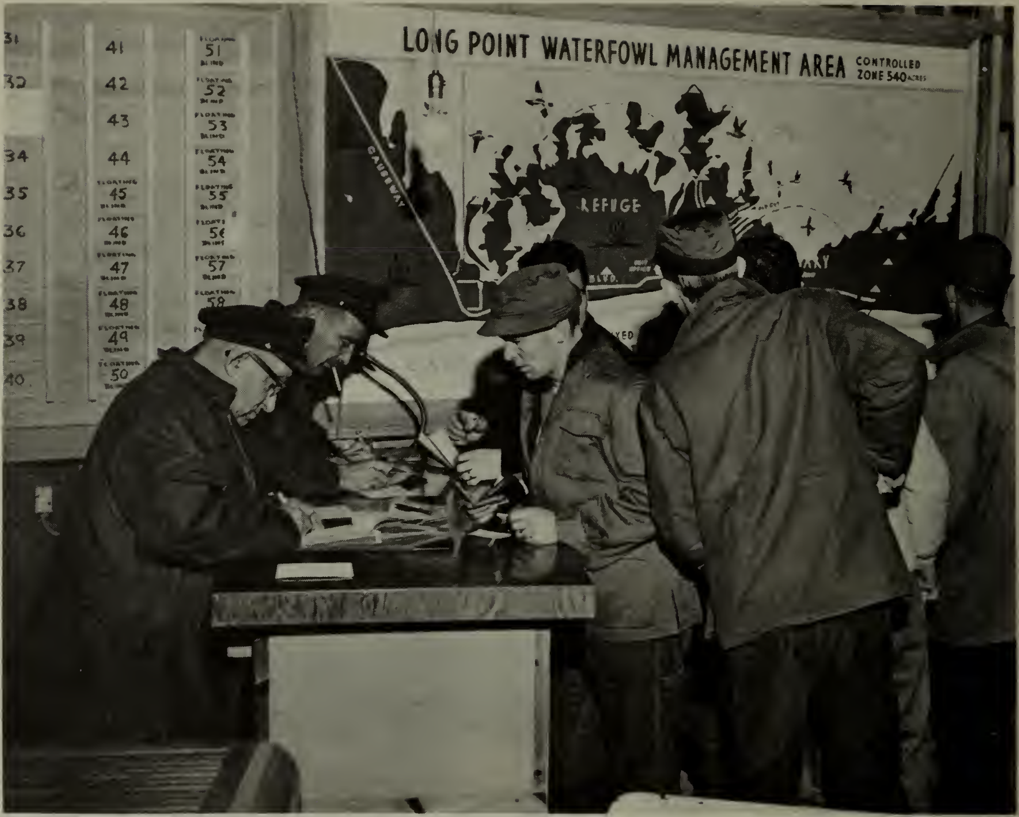
The organization of the hunting at the Long Point Waterfowl Management Unit was designed to give hunters a pleasant experience and reduce as much possible the annoyance of interference by others, as well as to give the ducks as much protection as possible without restricting hunting beyond reasonable limits. The total area of 1,700 acres was posted with signs marking the boundary of the Unit. The best portion of the marsh (from a duck's eye-view), comprising 790 acres, was set aside as a refuge, and this area was posted at 400-foot intervals with signs. A feeding sanctuary was established east of the refuge where ducks were fed corn and barley to supplement the natural food supplies in the area. A half-mile radius around the feeding sanctuary ponds was posted with signs to prevent hunting. Some dry land and open water areas were within this half mile radius so that only 250 acres of marsh were actually included in the feeding sanctuary.

Half-acre shooting ponds, 120' x 240', were dug to give hunters enough open water to drop their ducks into the pond, thus preventing the loss of cripples.

The remaining 750 acres of marsh were divided into two zones. In the smaller 200-acre zone, no blinds were provided and free, daily permits were issued to any number of hunters to hunt ducks during the days and hours specified for hunting.

In the larger 550-acre zone, blind sites were spaced over 1,000 feet apart so that each one occupied an area in excess of 20 acres. These blind sites

Waterfowl were held in the area by setting out corn and barley in the Feeding Sanctuary late in the fall when natural food supplies were exhausted. Standing room only, here.


LONG POINT WATERFOWL MANAGEMENT AREA
CONTROLLED ZONE 540 ACRES
REFUGE
CAUSEWAY

The Unit parking lot was a hive of activity by 5.00 a.m. on most Saturdays. The car line-up was arranged for the convenience of hunters.

Before he reaches the permit desk, a hunter must study map and make a major decision: his choice of a blind for the day. Blind 33 has been taken.

bordered both the sanctuary and the refuge, and floating blinds were also set along the periphery of the marsh, itself.

At each blind site, a shooting pond, 120′ x 240′, was prepared. In some cases, the site was on a natural pond. In other locations, the pond site was in thick cattail which was cut out to leave the 120′ x 240′ open space. At other sites, there was no permanent water, and it was necessary to dig eleven ponds, using draglines, and to level the spoil with bulldozers. The latter ponds were most artificial in

Decoys, essential for hunting from a blind, were supplied to hunters who did not have their own. Eight were available for each blind.

appearance in the fall of 1961. Nevertheless, ducks were using them soon after their creation, and it appeared that they provided a considerable number of new nesting sites for ducks this spring.

The feeding sanctuary pond was dug so that two large islands were left in the centre of the 240′ x 240′ pond. The area was fenced to provide protection from humans and predators. Almost two acres of land and water were surrounded by fencing.

This pond, which was finished in mid-September, attracted up to 15,000 ducks by November. However, only 6,000 could comfortably land in the pond or within the enclosure at one time. In the photograph, 692 ducks can be counted, pitching-in to the ponds, and over 700 were on the banks of the ponds which are not in view.

During the past spring, six pairs of Canada geese were transferred from our goose pens on the St. Lawrence River to the fenced sanctuary pond. Most of these geese have paired and attempted to nest and some have raised young. It is hoped that the feeding sanctuary pond at Long Point may be used successfully to establish a goose colony and provide goose hunting on the Unit within the next five years.

Two types of wooden blinds were set out on the area. A permanent type, laced with cattail for camouflage, was used on the marsh ponds. These were built with floors and seats, large enough to accommodate two men and a dog. A floating type, brushed with cedar boughs, was used off shore. Each of these was attached with wire to a stake driven into the bottom of the bay. They were large enough to accommodate a 16-foot boat and were brushed well enough to hide both boat and hunters most effectively except, of course, when the shooting starts.

The system of handling hunters wishing to use the area, although complicated, worked to most people's satisfaction. Reservations for twenty-five blinds were accepted, along with $4.00 blind fee, no more than seven days previous to the day of hunting. An additional 17 marsh blinds and 16 floating blinds were available on a rush basis. These arrangements meant that a hunter, coming from a distance, could assure a place on the marsh without taking his chances with the rush seats.

Specific blinds were not reserved. Hunters had to line up and choose their blind as they arrived at the office. On the first few weekends, the line-ups began long before sunrise in the parking lot adjacent to the office. The hunters chose their blind number from a map in the Unit office and were issued a permit before 6.00 a.m. This allowed them an hour to get to their blinds before shooting began at 7.00 a.m. Each hunter or pair was issued eight large mallard and black duck decoys for use at the blind. Mimeographed maps were available, and a few directional signs in open water areas assisted hunters to their blinds.

During the 40-day season (Monday, Wednesday, Thursday, and Saturday for ten weeks), 795 blinds were rented, accommodating 1,472 hunters. They bagged 811 ducks, an average of .55

A blind and set of decoys on a pond which had been mowed to provide open water. (Some hunters did not learn to keep down in their blind.)

ducks per man per day, or one duck per blind per day. On the area where hunters were not provided blinds, and where permits were free, 409 hunters bagged 205 ducks, or .50 ducks per man-day.

The bag of waterfowl last fall was not as high as originally expected. On such areas, it is believed that between one and two ducks per hunter-day would be an optimum harvest.

Not all the responsibility for lower harvests can fall on the managers of the area. Many hunters have just not learned how to shoot waterfowl, using blinds and decoys. In such a situation, a considerable amount of skill is necessary—setting out decoys, calling ducks, shooting only when ducks are in range and, of course, hitting them! While the average bag was not high, many skilled hunters shot their limit.

In 75 days of use, 102 ducks (mainly divers) were shot from this type of floating blind which holds two men, a dog and a 16-foot motor boat.

At the same time, our first year of operations was primarily directed towards the organization and management of hunters. Now we have this started, we, ourselves, must develop our skills in holding migrant birds, increasing local production of waterfowl and providing a high quality of outdoor recreation.

THE FARMER AND WILDLIFE

by C.H.D. Clarke
Chief, Fish and Wildlife Branch

The work of the Department of Lands and Forests keeps us in close touch with hunters, anglers, naturalists and others who take an active interest in wildlife. We are also very close to the large proportion of farmers who are interested in it. Every once in a while, we hear from some householder, cottager or farmer whose personal inclination is to pay little attention to wildlife, but into whose affairs wildlife has intruded itself. As we are concerned here with the nuisance aspect of wildlife and its control, we have to give some prominence to such occurrences. Wildlife also causes hunters and hunting, some of whom may in turn make a nuisance of themselves.

To begin with, it seems reasonable to point out that hunters in Ontario spend much more than one hundred million dollars a year on their sport; that hunting is the most universal form of recreation among the rural community, proportionally more important to them than to others; and that wildlife has all sorts of unmeasurable values in combatting forest pests, and crop pests too, and in simply making the world a more interesting and satisfying place to live in.

Some general control principles are worth mentioning. Most damage by wildlife is caused by species that are prolific and abundant. If the trouble occurs because some source of food, some nesting site or shelter, is particularly attractive, the only remedy is prevention. It does no good to kill, leaving the attraction in place, because no amount of killing at such a spot will have any effect. It is like spooning water out of a well. On the other hand, if the damage, as is often the case, is due to the peculiar behaviour of one individual, the cure is to remove the individual, not to declare war on the species at large. Whether or not the species at large needs or deserves protection is irrelevant.

Damages are not paid by the Government for wildlife depredations. In many cases, the person suffering them is as free to deal with the animal concerned as he is to destroy potato bugs. In most of the cases where he is not, arrangements can be made for some sort of action. Only game birds and big game animals are sacrosanct, and this is due in part to the restriction on public hunting imposed in accordance with the wishes of the rural community. We do find, however, a basic difference between birds and mammals and potato bugs, even if we assume that the farmer does not wish the same freedom in dealing with both.

The wildlife species that can really be called crop pests are blackbirds, starlings and deer. I think of them as creatures causing real damage under certain circumstances, with prevention and control equally uncertain. For the rest, we have a few hazards and a number of occasional nuisances. The nuisance list is a long one and includes a great many creatures which could normally be described as useful, or at least harmless, and interesting. None of them could honestly be described as crop pests. I can list crows, English sparrows, domestic pigeons, hawks and

Most farmers do not object to hunting on their land when permission is asked, as above. The farmer tells hunters where his cattle are pasturing. Below: a raccoon, a sometime pest and garbage raider. Photos by T. Jenkins.

owls, bats, shrews, moles, the whole gamut of fur-bearing animals that occasionally get in a hen-house, even bears, insofar as the farmer is concerned. All the defensive measures needed are a little extra trouble to protect the crops and poultry, or the skill to remove an offending individual. Porcupines, squirrels and raccoons in buildings are also in the nuisance category, as are also squirrels and raccoons in corn. Against none of these things are there any blanket measures available or desirable.

The elimination of offending individuals was something the younger segment of the farming community used to undertake with great gusto and a high degree of expert knowledge. I see with dismay an increasing number of crop-processors who have none of the traditional farm boy's knowledge of nature and skill with trap and gun. I suppose we will have to get out a booklet one day on how to tell what it is that is harrassing the hens or picking at the pears, and how to get rid of him after you have found out. I do not propose to give the substance of such a bulletin here.

Of course, there is no sharp line between the nuisances and the crop hazards. Our first choice in hazards falls on wolves. Damage to livestock from dogs is common. Damage from wolves is so rare in this province that I hesitate to class it as a hazard, but it is something that affects the Department of Lands and Forests directly. All depredations of wolves on livestock should be reported to the nearest officer at once. In that way, it will be possible to learn whether a wolf really is involved, and the onus for action is placed on the Department. Since this province was settled, we have attempted to control wolves by bounty payments. For many years, our annual payments have averaged around $50,000. One of these days, we are going to put out an authoritative history of bounties in this province, but I can give you some of the results of the bounty system. They are:—

1. *The numbers of wolves have not been affected. There is not a shred of evidence to indicate that there are any fewer wolves today than there would have been if we had never paid a cent of bounty.*

2. *The distribution of wolves has not been affected. There are timber wolves today everywhere a timber wolf could reasonably be expected to live.*

3. *A second species of wolf, the brush wolf or coyote, living in cleared areas, has entered the province and spread to all the cleared areas. Its depredations are more serious to farmers than those of the timber wolf. Therefore, after generations of bounty payments, we are more troubled by wolves than were our pioneer ancestors, because we now have two species.*

We ought to find another way. Whatever we try, it could not be more futile than bounties.

Groundhogs used to be described as a crop hazard. Previous generations justified groundhog hunts by saying that horses broke their legs in the holes. Modern horsepower is not so vulnerable, yet real damage to crops does occur. On the other hand, what animal is so completely vulnerable to control?

Small birds are a hazard to small fruits. You can get a permit to shoot

Rabbits often attack the bark of growing trees and shrubs when deep snow cuts off other food supplies. Below: The red fox, sometimes a threat to poultry, has been nearly eliminated by rabies. Photos by T. Jenkins.

them but I recommend against such a frustrating gesture except as a last resort. Many fruits can be covered. For others, a "distraction plantation" of honeysuckle, mulberry and early cherries will draw the birds away from the crop.

Pheasants are in a special category because you cannot get a permit to shoot them. They sometimes damage grain and can cause trouble in tomatoes. In the latter case, the damage takes place in dry weather and the tomatoes are an accidentally discovered substitute for water, more acceptable than the real thing once the habit is established. Pheasant depredations are controlled by providing food and water substitutes. Especially effective is the baited trail of food laid around the area of depredation. If it gets really serious, the Department of Lands and Forests may arrange for live-trapping.

Mice and rabbits are a hazard to woody plants in winter. The damage is preventable. Mice operate under the snow and rabbits above. Wrappings of metal foil are the best protection against mice, and wire against rabbits. Very soon, repellents will be available for those who want them. They are already so in Europe.

One cannot leave the question of hazards without bringing up the question of rabies in foxes and skunks. Originally, both of these animals were in the nuisance category, to be dealt with by removing offending individuals. Where skunks are after white grubs in your lawn, it is an interesting problem of balancing the plague and the relief against each other.

Rabies puts both skunks and foxes in a different light. Fortunately, other species, though occasionally affected, are not as yet primary carriers. Foxes were very abundant in southern Ontario when rabies appeared. It was an Arctic type of the disease, carried by foxes. In most of the known cases of transmission, a red fox was the agent. There was a certain amount of hysteria but only two human cases were reported. Unfortunately, cattle are very susceptible to rabies. They are also very curious beasts, likely to gather round a sick fox and nuzzle it, or stamp at it, so that they do run unusual risks of getting bitten. Add to this the fact that there was no protection for the beasts via the hypodermic needle, as there is for dogs and cats, and it is not surprising that we lost a number of cattle. Fortunately, compensation was arranged. Protection is now available.

The porcupine's craving for salt sometimes leads to sorties into farm buildings where doors and handles of hand tools are gnawed away.

We could have poisoned foxes but cost estimates made it clear that compensation for cattle was very much less expensive. Furthermore, we now know that the disease, itself, made a nearly clean sweep of the foxes. Poisoning, by thinning them without eradicating them, might actually have helped the disease to persist. We never had a hope, when fox control was being discussed some time ago, of bringing about by any human agency such a scarcity of foxes as now exists, and yet, rabies is still found in the remnant. Moreover, rabies is now appearing more commonly in skunks and this is obviously a greater hazard to human life than was rabies in foxes—witness our two deaths—because of the more intimate association of skunks with our buildings. For livestock, the hazard is probably less than with foxes because of the different habits of the two

animals. The need for immunizing dogs and cats, especially the latter, is greater, and the need for following up on all cases of animal bites is very obvious.

There is another aspect to wildlife damage in the country which I shall discuss. Wildlife attracts people and people do damage. It isn't only hunters or even wildflower pickers. If your place has a nice, fresh "out-of-doorsy" sort of appearance, that is all some Sunday drivers are looking for. Sad to say, man is an animal, unique among them all in that he habitually fouls his environment, as an individual and, as a species, he destroys it. Dealing with the species is called conservation. Dealing with the destructive individual is a minor business which, for lack of a better word, we can call the prevention of vandalism.

As far as legal implications are concerned, I can give my own opinion that some formula should be found for making it simpler for the farmer to protect himself. If farmers feel that way, then their groups can pass their own resolutions. I do hope, however, that the ultimate solution is not to make the countryside such a dismal place that there is no game to hunt, no fish to catch, and nothing, in short, to give the rest of humanity any idea other than to drive on as fast as possible. There has to be a better way than that. I can see, in fact, two ways. One is for organized action to meet the public need for space for recreation. We now have conservation authority parks, municipal parks, commission parks and provincial parks to meet the needs of the picnicker and camper. How far we have yet to go, you can judge as well as I. We still have not done much for the hunter or angler in our crowded areas. The other is for all of us, somehow, to find ways of improving our standards of honesty, decency and consideration for the other fellow. What it amounts to is living up to the Golden Rule and, if I were a farmer, trying to decide whether or not to let somebody use my property, I would be inclined to try to find out whether he had ever heard of this sacred precept.

At the beginning, I pointed out that hunting is a valuable recreation, making a real contribution to the economy of the country, and that it was especially important to the rural community for whom both opportunity and inclination are more likely to lead to hunting than to golf or skin-diving or glider flying. Hunting is an activity of people and it takes place where people are, and not in any vague, uninhabited wilderness. Wherever you have the maximum opportunity for men and huntable creatures to come into contact, there will be the scene of your maximum hunting pressure. In Ontario, that is obviously on farms in south-western Ontario, not on the shores of Hudson Bay. It is our finding that, generally farmers don't mind hunting. It is only when hunting pressure becomes obvious that they become restive.

Here, in Ontario, we don't know what hunting pressure is. We have no area where it approaches the average for the whole north-eastern United States, and we can hardly even conceive of the high levels of hunting pressure some United States areas experience. An American visitor who drove from Cornwall to Toronto on a fall week-day, recently, passed miles of pleasant woods and fields without seeing a single hunter. He remarked that we don't know the meaning of hunting pressure. On a beautiful Saturday morning just before Christmas, I drove a fifty-mile transect of the best hunting areas just outside Toronto and Oshawa, and found five cars parked that could have belonged to hunters. For three of them, in fact, the hunters were visible. This was the largest number of hunters found in three runs of the same transect last fall. I never heard of a farmer here, taking out insurance against damage to livestock and property by hunters, but it is done elsewhere, and I expect that it would be very inexpensive because the risk of loss, on which rates are based, is certainly very low.

Nevertheless, we do get days of heavy hunting pressure here, and areas of pressure, and something can be done about it. The owner can post his land and, in so doing, get statutory support from the Game and Fisheries Act. Some owners wonder why they cannot sell shooting rights as in Europe. The answer to that is that you can, but you must actively practise game management before you can have anything that anybody would be willing to pay for. Our laws do, in fact, provide for the most intensive form of private use, namely, commercial pheasant shooting preserves under special licence. There are quite a few of them now, and they begin to look more and more like a new and different way to make money out of rural land, including some land that will produce very little revenue any other way.

Do not, however, get the idea that game is a product of poor land. Acre for acre, rich land produces more game than poor land as many studies have shown. One might get the idea that one way to get rid of hunters would be to grub out all game cover and try to make the farm uninhabitable for wildlife. If the land is worth farming in the first place, then such a scheme would be sure to fail. By the same token, if I were buying a farm, I should be very suspicious indeed of the place that was conspicuously wanting in wildlife.

In the most densely populated part of southern Ontario, which is also our pheasant area, we have a unique system of restricted township licences for pheasant hunters, originally designed and still intended to avoid concentrations in a few areas. We strive for the same goal by putting every obstacle we can think of in the way of carnival atmosphere on opening days. Experience has shown that, if we could arrange for the opening day of pheasant season always to have such miserable weather that most hunters stay home, the rest of the season could run through three weeks of sunshine and hunting pressure would be so scattered that little notice would be taken of it. In southern Ontario deer seasons, we have a choice between a November season, with cattle still out but very few hunters, and a later season, with cattle inside but hunters much more conspicuous. Up to now, we have been guided by our experience that farmers want the deer thinned out, but not too much, and the first alternative is chosen.

In the United States, the response to heavy hunting pressure on the farm is to set up public hunting grounds, where game management becomes the first consideration, and draw the hunters to them. There is a trend towards such a development here.

In fact, I can say in conclusion that we can see all sorts of trends, but there is one trend that has not appeared and seems unlikely to appear, and that is away from hunting. Hunters and hunting increase about 10 per cent per year. Unless we run into another major depression, the prospects are for more and still more of both hunters and hunting.

Marten love to travel, and one meandering marten tagged last November, 35 miles north of here has recently been trapped in Kapuskasing District, 104 miles away as the crow flies. These fur-bearers are known to travel long distances during their winter treks.—Chapleau Weekly News Release, 1962.

COMMERCIAL FISHING IN THE GREAT LAKES

by W.H.R. Werner
Supervisor, Commercial Fish Section

During the past 20 years, many significant changes have occurred in the Ontario commercial fishery of the Great Lakes. These changes are not apparent if we only look at the total poundage landed each year. It is only when we compare the composition of the catch and its value from year to year that we realize the changes that have taken place.

In the late 40's, the total fish landed varied from 25 to 35 million pounds, and the total value hovered between five and 6½ million dollars. In the period, 1955-59, the minimum total catch recorded was slightly over 47 million pounds (1958) and the maximum, a record for the Province, was just under 60 million pounds (1956). In 1959, the catch was approximately 49 million pounds, almost two million pounds more than in 1958. It is interesting to note the value of these catches. These were approximately 7¼ million dollars in 1958, almost eight million dollars in 1956 and less than five million in 1959. Thus, the average price per pound was, roughly, slightly over 15¢ in 1958, 13¢ in 1956 and 10¢ in 1959. To complete the picture, the average price per pound in 1955 and 1957 was slightly less than 15¢ and 14¢, respectively. While the above statistics refer to the total Ontario fishery, including some waters other than the Great Lakes, they reflect the situation in the Great Lakes accurately.

It is not the intention here to go into the economics of this fishery but to describe some of the characteristics of it and the changes that have taken place in the past few years. Some of these changes account, in part, for the fluctuations in value. Before describing the fishery in each of the lakes, it would seem desirable to describe briefly the various gears used to capture fish in these waters, for the benefit of those not familiar with the various types of fishing gear.

Our most commonly used gear is the gill-net. This might be described as a fence of very fine webbing, usually set on the bottom of the lake. The lower edge of the "fence" is held to the bottom by lead weights and the upper edge is held up by floats. The fish run into this fence and are caught by their gill covers (gilled) provided the fish is of such a size that it will gill in the net in question.

Pound-nets, trap-nets and hoop-nets are stationary, impounding types of net. These are made of heavy webbing, held to the bottom by means of weights and held upright by floats. One part of the net leads the fish into a box-like trap made of netting. Once in the trap part of the net, the fish find it difficult to get out again. Fish taken in this type of net are usually alive when the net is lifted and are therefore

Right, above: A Lake Erie gill-net boat entering the harbour at Port Dover. Photo by W.H.R. Werner.

Right, below: A catch of smelt in the cod end of a Lake Erie trawl. Photo by J. Brubacher.

SOUTH SEA

of superior quality. Hoop-nets are usually set in shallow water for capturing fish such as bullheads and pan fish.

Trawls and seines are nets which are dragged through the water and actively capture fish. In seining, the net is run around a group of fish, the two ends are brought together and hauled up until the fish are coralled into a small area of the net where they can be dipped out. The trawl may be thought of as a variation of the seine, with a deep bag in the centre, which is towed in the open position behind a boat for a period of time (perhaps an hour). The fish are forced into the bag by the towing motion and are hauled on board ship as seen in the photograph.

The hoop-net is an excellent shallow-water net for taking warm water species of fish, especially bullheads and catfish. In addition, it takes eels, perch, suckers, sunfish, rock bass, crappies, etc. Since the fish are taken alive in this impounding type of net, a new method of marketing has recently developed. The fish are sold alive to buyers who truck them in tank trucks to private lakes or ponds in the U.S.A. where persons pay for the privilege of angling for them.

LAKE ONTARIO

This is principally a gill-net and hoop-net fishery, mainly carried out in the Bay of Quinte area. Bay of Quinte is the principal, and almost the only, spawning ground in the lake. Some gill-net production takes place near the Niagara River mouth. Seines are used as well as gill-nets in the eastern end of the lake to take carp. Hooks are used here also for catfish and eels.

Previous to 1900, this lake supported a large population of landlocked Atlantic Salmon but these disappeared at the turn of the century. They were supplanted in the catches by a fair population of lake trout, whitefish and herring. While the production from Lake Ontario has been relatively constant (two to three million pounds during the past 20 years), the lake trout has virtually disappeared, probably due mainly to sea lamprey predation, and the lake herring are much reduced in numbers. Whitefish and yellow pickerel have fluctuated considerably.

Lake Ontario is the only one of the Great Lakes that has an eel fishery and, as a result of increased demand for this fish by European immigrants, the fishermen have increased their efforts to catch them with resultant increases in catch. Since the adult eels go down to the sea to spawn and the larval eels must come from the sea, it is quite possible that St. Lawrence Seaway and the related power development may have a very definite affect on our eel fishery.

LAKE ERIE

Lake Erie is remarkable in many ways. It is the shallowest of the Great Lakes and the smallest in area, with the exception of Lake Ontario, yet it produces from 50 to 75 per cent of the fish landed in the whole province. It contains more species of game fish, commercial fish and potentially commercial fish than any other body of water in Ontario.

If we look at the statistics of catch between 1910 and 1924, we see that the main species caught were herring or ciscoes, whitefish, pickerel (mostly yellow) and sturgeon. Since that time, the herring and sturgeon have practically disappeared from the catch (except for one sporadic upsurge of herring in 1945-46). More recently, the whitefish has almost disappeared from the catch also, and the warm water species have become dominant. At the same time, total production has greatly increased, e.g., nine million pounds in 1941 and 44 million pounds in 1956. Recently, the dominant species in the catch has varied through blue pickerel, yellow pickerel, yellow perch, white bass and smelt. Large populations of sheepshead and gizzard shad have been present in various years, also.

It is interesting to note the changes in fishing methods that have taken place on Lake Erie (and to a lesser extent on other waters) in recent years. Previous to 1946, the Lake Erie fishery consisted almost entirely of gill-nets and pound-nets, with a few seines and hooks being used in certain areas. The gill-net is still a very important gear but has undergone changes. In the late 40's, nylon gill-net, which proved to be more efficient than cotton or linen, was introduced. In the late 50's, the fishermen discovered that, by raising these nets up off the bottom ("canning") to the depth where the fish (yellow pickerel in particular) were swimming, they could catch them more efficiently and at times of the year when they formerly were unable to do so. In the early 50's, the majority of the pound netters traded their pound-nets for trap-nets. Since pound-nets are anchored and supported by stakes, they are fixed in their location, whereas the trap is held in place by anchors and supported by buoys and are, therefore, mobile. The trap-net thus could be moved as the fish moved and could be set in deeper water than the pound-nets.

When the smelt first appeared in Lake Erie, they were considered a nuisance fish by fishermen. There was little or no market for them, and it was not profitable to fish them with gill-nets since the labour costs of removing them were too high in relation to the market price. In addition, they became so numerous that they clogged up the nets set for whitefish, making it unprofitable to fish for whitefish.

Gradually, a market was developed for smelt, and fishermen began fishing for them with seines, pound-nets and trap-nets during the smelt spawning season. By freezing and processing these fish, they were able to market about 5 million pounds a year. In the meantime, fishermen were giving much thought to the development of a different type of gear that would be able to harvest these fish profitably at other times of the year. As a result of this and with the considerable assistance of the Fisheries Research Board of Canada and later the Industrial Development Service of the Federal Department of Fisheries, the bottom trawl and the mid-water trawl are now operating on Lake Erie for the taking of smelt. The only limiting factor to smelt production at present on Lake Erie appears to be the ability of the market to absorb them at a price that will provide a reasonable profit to the fishermen. Smelt can now be produced throughout the year and they are present in tremendous quantities.

LAKE ST. CLAIR

Lake St. Clair is a small, shallow lake having some of the characteristics of the western end of Lake Erie. Production ranges from about 500,000 to 1,000,000 pounds per year and consists chiefly of yellow pickerel, sturgeon, bullheads, catfish, carp and perch, with some pike, saugers, sheepshead and other coarse fish being taken, also. Fishing is mainly done by hooks, seines and what is called a pound-net but is, in reality, a very large hoop-net.

LAKE HURON, including Georgian Bay and North Channel

While some yellow pickerel, perch and sturgeon are taken in local areas of Lake Huron, the greater part of the lake has, in the past, produced commercially only lake trout, whitefish and chubs (herring). The chub fishery has been limited to some extent by market problems and, consequently, until recently the main fishery was for lake trout and whitefish. When the sea lamprey practically eliminated the lake trout in the 1940's, the fishery was limited to whitefish and some chubs. Thus, fluctuations in the whitefish populations have a terrific impact on the fishery now, especially in Georgian Bay and the North Channel. Due to low whitefish populations in Georgian Bay and North Channel, the 1959 production from Lake Huron was quite low, amounting to 2,600,000 lbs. However, as a result of increased production of chubs, perch and whitefish from Lake Huron proper (i.e., excluding Georgian Bay and North Channel), the total catch increased to over 3,800,000 lbs. in 1960 and to over 5,000,000 lbs. in 1961. Gill-nets are used for the most part, with some pound-nets and trap-nets used in local areas.

LAKE SUPERIOR

This is the largest, deepest and coldest of the Great Lakes. Conditions here are somewhat similar to that of Georgian Bay except that there never has been a large whitefish fishery on this lake. Consequently, there is more dependence on the lake trout. Since the lamprey did not appear in Lake Superior in large numbers until about 1955, the lake trout populations have not yet been completely eliminated. The control of the sea lamprey and the rehabilitation of lake trout in Lake Superior is directed by the Great Lakes Fishery Commission. The first efforts to control the lamprey were directed towards prevention of spawning by the erection of barriers, either mechanical or electrical, in the spawning streams. However, it was recognized that a more effective way would be to kill the larval lamprey, embedded in the mud downstream from the spawning area, since this would eliminate four or five year-classes of lamprey at one time. After testing in the neighbourhood of 6,000 different chemicals, two or three were discovered that were specific for lamprey larvae and would do little or no harm to other fish in the concentrations required. Chemical treatments of all lamprey-inhabited streams in Lake Superior have been completed and it now appears that some control has been effected.

For the past three years, heavy planting of lake trout yearlings have been made by both the United States and Canadian agencies interested in this fishery, including the Department of Lands and Forests, of course. Scientific evaluation of these plantings has shown them to be very successful. It is hoped that, when these fish reach maturity (age 7), they will make a very significant contribution to the lake trout population and accelerate rehabilitation of this species.

There is a large production of herring in the fall but these fish sell at a very low price. Total production in 1961 was about two million pounds of which 1½ million pounds were herring. The balance of the catch consisted mainly of whitefish, lake trout, yellow pickerel, sturgeon, chubs and saugers. Fishing is mainly by gill-net, with a few pound-nets being used.

Dip-netting a catch of whitefish at South Bay, Manitoulin Island, George Brown's photo (below) shows a seine net being pulled in, Long Point Bay, Lake Erie.